d.) Remarks

No amendments or new claims are introduced with this Response and, thus, claims 1-38 are presently pending and under consideration.

Remarks Regarding 35 U.S.C. § 102(b)

Claims 9, 12, 13, 16, and 17 stand rejected, under 35 U.S.C. §102(b), as allegedly anticipated by Nelson et al. (U.S. Patent No. 4,873,481). This rejection is respectfully traversed.

Claim 9 recites "A method of producing millimeter- and submillimeter-wave noise, without an oscillator, comprising: generating a first noise band; and converting said first noise band into a second noise band, wherein said second noise band comprises a continuum of random millimeter- and submillimeter-wave noise."

The Examiner alleges that Nelson discloses a microwave radiometer that is used in the 60 GHz region (which is allegedly part of the millimeter and submillimeter spectrum) (citing col. 5, lines 10-18). The Examiner also refers to Fig. 3, which he alleges shows a blackbody microwave assembly 41 for generating a particular band and a noise generating diode (assembly 49) that adds to the first band and thus is converted to a second band (citing col. 14, lines 10-51). Attenuators 93, 95 reduce the power level before the cross coupling with the first band signals via 96,97. The second band is directed toward a destination within the assembly. Applicant respectfully submits that Nelson fails to teach or suggest the features of claim 9.

Nelson is directed to a passive, multi-channel microwave radiometer for atmospheric sensing (see abstract). Although the Examiner cites to Fig. 3 and col. 14, the Examiner may be misinterpreting Nelson.

The calibration procedure described in Nelson is a standard technique. It is known that that a radiometer can be calibrated by using two reference signals with different noise power

levels as shown in Figs. 2B and 2C of Nelson. Since the noise power of a thermal noise source (for instance, a blackbody) at a temperature T is given by P = kTB, where P is the noise power available at the output of the thermal noise source, k = 1.38 x 10 -23 J/K is Boltzmann's constant and B is the noise bandwidth, a blackbody at an ambient temperature of TBB can be used as one of the reference sources, as shown in Figs. 2, 3 and 7 of Nelson. According to Nelson, the second reference signal for calibration is derived by adding an extra 200 K of noise power, obtained by attenuating the noise from the broad band noise diode assembly (*see* Nelson Fig. 3, element 49), to the blackbody noise signal. This is accomplished as follows: both the blackbody and the noise diode are broadband noise sources, covering both the first frequency (23.8 GHz) channel and the second frequency (31.4 GHz) channel of the radiometer (*see* Nelson column 21, lines 30-35). The 23.8 GHz and 31.4 GHz blackbody noise signals at a power level of T_{BB} and the 23.8 GHz and 31.4 GHz noise diode signal of ~ 200 K are combined in the cross-couplers (*see* Nelson Fig. 3, components 96 and 97) respectively (*see* Nelson column 14, lines 40-45 and Fig. 3) and delivered to the first waveguide (*see* Nelson Fig. 3, component 27). Since the coupler is a linear component and can not change the frequencies of the noise signals (i.e., no frequency conversion), the noise signals delivered to the waveguide (*see* Nelson Fig. 3, component 27) remain at 23.8 GHz and 31.4 GHz but at a noise power level of $T_{BB+ND} = T_{BB}+200$ K as shown in Figs. 2B and 2C. Therefore, contrary to the Examiner's assertion on page 2, second paragraph of the Office Action, Nelson does not disclose or suggest anything related to "adds to the first band . . . and thus is converted to the second band . . . ." The whole process simply increases the noise power level (temperature), at both 23.8 GHz and 31.4 GHz, from the blackbody radiation (T_{BB}) along to a higher level of T_{BB+ND}. Furthermore, as described in page 5, lines 15-25 of the present application, the microwave power level of the claimed "first band" is at least 20 dBm (the maximum safe input level of the multiplier). Assuming a noise bandwidth of 60 GHz (*see*

applicant's specification page 5, line 15) and using the formula P = kTB, the effective temperature of the claimed "first band" noise is ~ 1.2 x 10^{11} K which is 400 million times the noise temperature of the ambient blackbody and 12 million times the temperature of the noise diode (~10,000 K) of Nelson.

Thus, Nelson fails to teach or suggest frequency conversion of noise without an oscillator or producing levels of noise at microwave, millimeter and sub-millimeter wavelengths much higher than generated with existing circuits. Accordingly, Nelson does not teach or suggest claim 9. Applicant respectfully requests that this rejection be withdrawn.

Conclusion

The application is in condition for allowance and the prompt issuance of a Notice of Allowance is respectfully requested. If there are any fees due with the filing of this Amendment, not otherwise accounted for herein, including any fees for an extension of time, applicant respectfully requests that extension and further requests that any and all such fees be charged to Deposit Account No. 03-1952.

Respectfully submitted
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Date: July 6, 2004

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